

REMARKS/ARGUMENTS
Explanation of Amendments

The proposed amendments point out several additional differences between Applicant's process and apparatus and the process gas cooler disclosed in Richter, and are also believed to overcome the lack of antecedent basis objection to claim 1. Support for the amendments is found in Figs. 1-6 of the present application, all of which show the upstream part of heat exchange tube 4 positioned in the horizontal duct and arranged horizontally therein, while tube sheet 2a is also positioned in the horizontal duct and is arranged vertically therein. Figs. 1-6 also show the downstream or main tubular part to be positioned in the heat exchange vessel and arranged vertically therein. Claim 1 has also been amended to use more process type language as suggested by the Examiner.

Claim Objection

The objection to claim 1 because of lack of antecedent basis for "the front" of the tube is believed obviated by the amendment eliminating this term. As pointed out by the Examiner during the constructive telephone interview with Applicant's attorney, the cooling medium in fact cools the entire tube sheet to a certain degree, although the side of the tube sheet coming in direct contact with the cooling medium (which Applicant considered to be the front of the tube sheet) is cooled more than the side of the tube sheet that is exposed to the hot gases. Accordingly, it is not believed necessary to specify which side is "the front" of the tube sheet. It is only necessary that "a side" of the tube sheet be exposed to the cooling medium and that the tube sheet is thereby cooled. Claim 1 has been amended accordingly and is believed to overcome the lack of antecedent basis objection.

Claim Rejections Based on Richter (US 3,915,224) in Combination with Brucher (US 6,148,908) further in view of Schuurmann (US 4,029,054)

Present claims 1 and 6, the only independent claims, have been amended to further distinguish the present invention over the process gas cooler disclosed in Richter. Present claims 1 and 6 have been amended to specify that the upstream tubular part in Applicant's process and apparatus, which is positioned in the horizontal duct, is arranged horizontally therein. This is in marked contrast to the upstream tubular part of tubes 3 in Richter, which are arranged vertically in the bottom of the process gas cooler.

In addition, present claims 1 and 6 have been amended to specify that the tube sheet, which is also positioned in the horizontal duct, is arranged vertically therein. This is in contrast to the tube sheet in Richter (the curved bottom of wall of process cooler 1 to which the ends of tubes 3 are attached) which has a general horizontal orientation.

Therefore, even if inlet section 2 in Richter is considered to be a horizontal duct, and because of the curvature of the bottom of the process gas cooler, the upstream end of tubes 3 in Richter are considered to be “positioned in a horizontal duct” (an interpretation with which Applicant respectfully disagrees), claims 1 and 6 as amended are still clearly distinguishable over Richter based on the horizontal arrangement of upstream tubular part in the horizontal duct in Applicant’s process apparatus versus the vertical arrangement of tubes 3 in Richter. Claims 1 and 6 are also clearly distinguishable over Richter on based on the vertical arrangement of the tube sheet in the horizontal duct in Applicant’s process and apparatus versus the horizontal orientation of the tube sheet in Richter (i.e., the generally horizontal curved bottom of process gas cooler 1 in Richter).

Since claims 2-5, 7- 9 and 11-15 are all directly or indirectly dependent on claims 1 and 6, as amended, they are also believed to be distinguishable over Richter for the reasons discussed above in connection with claims 1 and 6.

Accordingly, reconsideration and favorable action of the application is respectfully requested.

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